

WHAT IS CLAIMED IS:

1. A device, comprising:
a semiconductor substrate having a contact pad thereon;
a redistribution conductor having a base portion which is in electrical communication with the contact pad and having a laterally extending portion; and
a passivation layer disposed between the laterally extending portion and the substrate;
wherein the laterally extending portion forms a frangible bond to the passivation layer.
2. The device of claim 1, wherein the laterally extending portion is convoluted.
3. The device of claim 1, wherein the laterally extending portion terminates in a bumped contact, and wherein the laterally extending portion changes direction at least twice in going from the base portion to the bumped contact.
4. The device of claim 1, wherein the laterally extending portion terminates in a bumped contact, and wherein the laterally extending portion changes direction at least three times in going from the base portion to the bumped contact.
5. The device of claim 1, wherein the laterally extending portion is essentially serpentine in shape.

6. The device of claim 1, wherein the laterally extending portion comprises a plurality of linear segments joined together at an angle within the range of about 115° to about 155°.

7. The device of claim 1, wherein the laterally extending portion comprises a plurality of linear segments joined together at angles within the range of about 125° to about 145°.

8. The device of claim 1, wherein the laterally extending portion has an average minimum thickness of at least about 3 microns as measured along an axis extending through the center of, and orthogonal to, the laterally extending portion.

9. The device of claim 1, wherein the laterally extending portion has an average minimum thickness within the range of about 8 to about 16 microns as measured along an axis extending through the center of, and orthogonal to, the laterally extending portion.

10. The device of claim 1, further comprising a solder bump formed near an end of the redistribution conductor opposite the base portion and in electrical communication therewith.

11. The device of claim 1, further comprising a bumped contact in electrical communication with the redistribution conductor, and a PCB substrate in contact with said bumped contact.

12. The device of claim 11, wherein the PCB substrate is separated from the redistribution conductor by an open space.
13. The device of claim 1, further comprising a release layer disposed between the laterally extending portion and the passivation layer.
14. The device of claim 13, wherein the release layer comprises TiW.
15. A device, comprising:
 - a semiconductor substrate having a contact pad;
 - a passivation layer;
 - a redistribution conductor having a base portion which is in electrical communication with the contact pad, and a laterally extending portion which extends over said passivation layer; and
 - a release layer disposed between said passivation layer and said laterally extending portion.
16. The device of claim 15, wherein said release layer comprises TiW.
17. The device of claim 16, wherein said redistribution conductor comprises copper.

18. The device of claim 15, further comprising a solder bump formed near an end of the redistribution conductor opposite the base portion and in electrical communication therewith.

19. The device of claim 18, wherein the redistribution conductor is provided with a solder mask in the vicinity of said solder bump.

20. The device of claim 18, further comprising a mounting substrate in contact with said solder bump, and wherein the mounting substrate is separated from the redistribution conductor by an open space.

21. The device of claim 15, wherein the laterally extending portion has an average minimum thickness of at least about 3 microns as measured along an axis extending through the center of, and orthogonal to, the laterally extending portion.

22. The device of claim 15, wherein the laterally extending portion has an average minimum thickness within the range of about 8 to about 16 microns as measured along an axis extending through the center of, and orthogonal to, the laterally extending portion.

23. A method for making a semiconductor device, comprising the steps of:
providing a semiconductor substrate having a contact pad;
forming a first passivation layer over the substrate and patterning the first passivation layer such that at least a portion of the contact pad is exposed; and
forming a redistribution conductor having a base portion which is in electrical communication with the contact pad and having a convoluted, laterally extending portion which extends over the first passivation layer;
wherein the laterally extending portion forms a frangible bond to the first passivation layer.
24. The method of claim 23, further comprising the step of forming a release layer over the first passivation layer.
25. The method of claim 24, wherein the release layer is disposed between the redistribution conductor and the first passivation layer.
26. The method of claim 24, wherein the release layer comprises TiW.
27. The method of claim 23, wherein the redistribution conductor is formed by:
depositing a metallization layer over the first passivation layer;
depositing and patterning a second passivation layer over the metallization layer such that a portion of the metallization layer is exposed; and
electroplating the material of the redistribution conductor onto the exposed portion of the metallization layer.

28. The method of claim 27, wherein the material of the redistribution conductor is electroplated to a minimum thickness of at least about 3 microns as measured along an axis extending through the center of, and orthogonal to, the laterally extending portion.

29. A method for making a semiconductor device, comprising the steps of:
providing a semiconductor substrate having a contact pad;
depositing a first passivation layer over the substrate and patterning the first passivation layer such that at least a portion of the contact pad is exposed;
depositing a metallization layer over the first passivation layer;
depositing a second passivation layer over the metallization layer and patterning the second passivation layer such that at least a portion of the metallization layer in the vicinity of the contact pad is exposed; and
electroplating a redistribution conductor onto the exposed portion of the metallization layer such that the redistribution conductor has a base portion which is in electrical communication with the contact pad, and a laterally extending portion.

30. The method of claim 29, wherein the redistribution conductor has an average minimum thickness of at least about 3 microns as measured along an axis extending through the center of, and orthogonal to, the laterally extending portion.

31. The method of claim 29, wherein the second passivation layer is patterned such that the laterally extending portion is convoluted.

32. The method of claim 29, wherein the metallization layer forms a frangible bond to the first passivation layer.

33. The method of claim 29, wherein the second passivation layer is patterned such that the laterally extending portion is essentially serpentine in shape.

34. The method of claim 29, wherein the laterally extending portion has an average minimum thickness within the range of about 8 to about 16 microns as measured along an axis extending through the center of, and orthogonal to, the laterally extending portion.

35. The method of claim 29, further comprising the step of forming a solder bump in electrical communication with the redistribution conductor near an end of the redistribution conductor opposite the base portion.

36. The method of claim 29, wherein the laterally extending portion is connected to a solder joint and is adapted to reduce stress applied to the solder joint by delaminating from the first passivation layer.

37. The method of claim 29, wherein the laterally extending portion is connected to a solder joint, and wherein the bond between the first passivation layer and the metallization layer is sufficiently frangible such that the laterally extending portion

separates from the first passivation layer when sufficient stress is applied to the solder joint.

38. The method of claim 29, wherein the redistribution conductor comprises copper, wherein the metallization layer comprises a first layer of TiW and a second layer of copper, and wherein the first passivation layer comprises a polyimide.

39. The method of claim 29, further comprising the step of depositing a dewetting agent over portions of the redistribution conductor.

40. The method of claim 39, wherein both the metallization layer and the dewetting agent comprise TiW.